Employing Remote Sensing To Evaluate Changes In Land Use And Estimate Probable Pesticide Runoff To Surface Waters.

M. L. Tagert[1],
D. R. Shaw[1], J. H. Massey[1],
C. G. O'Hara[1], and R. L. Bingner[2]

Mississippi State University,
Mississippi State, MS[1]

USDA-ARS
National Sedimentation Laboratory,
Oxford, MS[2].

ABSTRACT

Remotely-sensed images, used with pre-existing databases, form a decision support system which can help prioritize waterbodies on Mississippi's 303(d) list that may potentially be de-listed. Landsat images were used to determine land use for the Upper Pearl River Watershed and combined with other digital data such as digital elevation models (DEMs) and soil classification information as inputs in the USDA nonpoint-source pollution model AGNPS. DEMs were obtained from the USGS National Elevation Database (NED), and digital soil data is from the USDA-NRCS State Soil Geographic Database (STATSGO). The TopAGNPS module of AGNPS performed a topographic evaluation of the watershed, as well as drainage area identification, synthetic channel networks, and watershed segmentation. ANNAGNPS, the pollutant-loading segment of the AGNPS model, will predict sediment and pesticide loadings for the watershed. Sediment sampling is being performed at three USGS gauged sites within the watershed, and grab samples are being taken for pesticide analysis at seven gauged sites. Sediment concentrations were averaged over the months of October, November, January, February, and March for the following sites: Burnside, Edinburg, and Carthage. Resulting concentrations were 15, 28, and 45 mg/L, respectively. Grab samples are currently being analyzed for sixteen different herbicides utilizing a multi-residue method. Both the sediment and pesticide samples will be compared to the predictions of the AGNPS model. Once validated, the AGNPS model will be used to determine the effects of land use changes by comparing the model predictions with the current land usage to the model results using late-1980's land usage.